Claim Rejections - 35 U.S.C. §102

Claims 1, 4, 6, 10 and 19-23 have been rejected as being anticipated by U.S. Patent No. 3,697,728 to Stirzenbecher. This patent discloses an airplane heating device incorporated into a light weight panel. The Stirzenbecher panel 10 comprises a honeycomb glass fiber core 12 (*e.g.*, a support level), a heating element 22 consisting of resistive foil 24 embedded in an electrically insulating sheet 26 (*e.g.*, a heater level), and a cover sheet 14 (*e.g.*, a protective cover layer). While the abstract implies that the honeycomb core 12 and the heating element 22 form a "subassembly," the detailed description clarifies that this "subassembly" is formed when "the lower surface of the sheet 26 is secured, as by an adhesive, to the upper surface of the core 12."[1] (See Stirzenbecher Figure 1, below.)

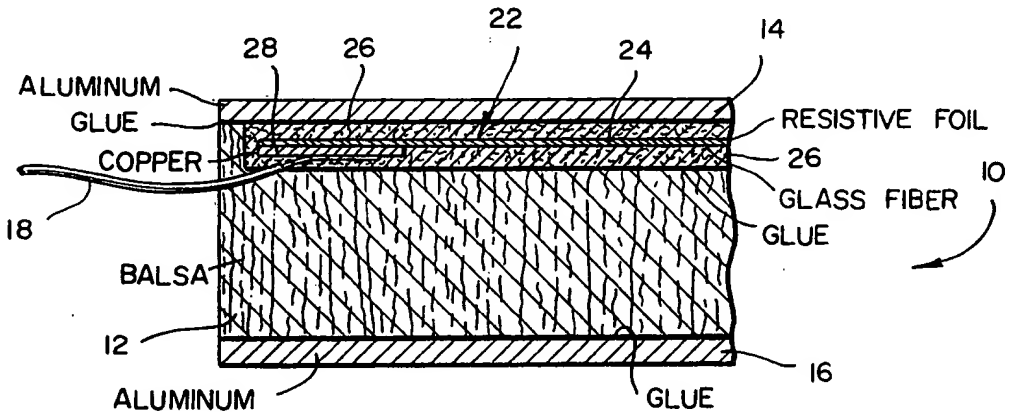


FIG. 1

Thus, Stirzenbecher does not appear to show or suggest an aircraft heated floor panel comprising "a plurality of layers cured together to form a lower support level and an upper heater level" as set forth in independent claims 1 and 19. Moreover, this reference seems to simply state that the upper cover sheet "is secured as by adhesive" to the upper surface of the heater level. It does not show or suggest "a pressure

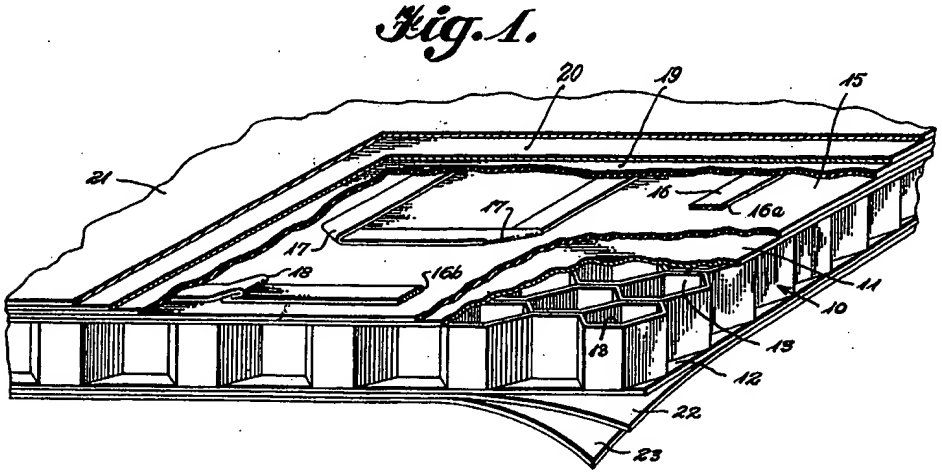
---

1. Stirzenbecher, column 8, lines 43-46. Also, the heating element 22 is contained in an upper recess of the core 12 so as to provide "upstanding peripheral flanges that protect the edges of the element." (*Id.*, column 8, lines 50-53.)

sensitive adhesive bonding the metal face sheet to the underlying support/heater layers" as set forth in claim 1 and/or "an elastic adhesive bonding the face sheet to the underlying support/heater layers whereby the different rates of thermal expansion may be accommodated during curing procedures" as set forth in claim 19.

Claim Rejections - 35 U.S.C. §103

Claims 1-10 and 19-25 are rejected as being obvious over Stirzenbecher in view of U.S. Patent No. 2,512,875 to Reynolds and further in view of some secondary references. This patent discloses a heating panel which is used as a wall piece in a "radiant heating system" and which is especially designed "to provide insulation particularly effective to prevent loss through the compartment walls by radiation itself." To this end, the Reynolds panel comprises a honeycomb core 10 having opposed surface sheets 11 and 12, a resistance element 16 positioned between electrically-insulating (*e.g.* paper) sheets 15 and 19, a heat distributing (*e.g.*, aluminum foil) sheet 20 overlying the sheet 19, and a decorative (*e.g.*, wall paper) layer 21 which constitutes the radiating face of the panel. (See Reynolds Figure 1, below.)



To assemble the Reynolds panel, the paper sheet 15 is adhesively secured to the honeycomb sheet 11. The resistance element 16 is then adhesively secured to the

paper sheet 15,[2] the sheet 19 is adhesively secured to the outer surface of the element 16 and to the exposed portions of the sheet 15, and the heat distributing sheet 20 is adhesively secured to the sheet 19.

Accordingly, Reynolds does not appear to show or suggest an aircraft heated floor panel comprising "a plurality of layers cured together to form a lower support level and an upper heater level" as set forth in independent claims 1 and 19. As explained above, Stirzenbecher also lacks these features of the invention and the secondary references do not cure this shortcoming in the proposed Reynolds/Stirzenbecher combination. For this reason alone, the claims are believed to be patentable over the applied art.

Furthermore, neither Reynolds nor Stirzenbecher teaches "a pressure sensitive adhesive bonding the metal face sheet to the underlying support/heater layers" as set forth in claim 1 and/or "an elastic adhesive bonding the face sheet to the underlying support/heater layers whereby the different rates of thermal expansion may be accommodated during curing procedures" as set forth in claim 19. The Examiner notes that "[i]n view of CA721834, it would have been obvious... to use thermosetting curable adhesives for the adhesives in the previously described apparatus so that the adhesives when cured do not soften or lose their electric insulating properties at elevated electrical heater operating temperatures."

However, in the Reynolds panel, the sheets 15 and 19 provide the electrical insulation whereby the adhesive securing the "face sheet" to the "underlying support/heater layers" need not be concerned with electric insulating properties. Moreover Reynolds is directed towards radiant heating systems wherein "the temperatures attained by the heating elements seldom exceed 120° F and are usually well down in the range of temperatures from 75° F to 120° F."

---

2. In assembling the resistance element 16 to the "supporting structure," Reynolds specifically states that "the sheet 15 is preferably provided with a relatively thick coat of adhesive material and the resistance element 16 is positioned thereon while the adhesive material is still wet or tacky. When the element 16 is positioned over the entire panel, an electric current is passed therethrough to heat the element. Such heating results in linear expansion of the element with resultant "buckling" at spaced points along its length. Such buckled portions then pressed down into such folds as suggested at 18 and thereafter comprise suitable expansion joints for the element 16."

Obvious-Type Double Patent Rejection

Claims 1-10 and 19-25 are provisionally rejected as being unpatentable over claims 2, 3 and 7-20 of copending Application No. 09/657,691 in view of Stirzenbecher. The claims cited by the Examiner from the copending application do not mention any type of adhesive bonding a metal face sheet to underlying support/heater layers, much less "a pressure sensitive adhesive" and/or "an elastic adhesive" so that "different rates of thermal expansion may be accommodated during curing procedures." As was explained above, Stirzenbecher seems to simply state that the upper cover sheet "is secured as by adhesive" whereby it cannot cure this shortcoming.

Conclusion

In view of the foregoing, it is respectfully submitted that this application is now in a condition for allowance and an early indication to that effect is earnestly solicited.

Should a petition for an Extension of Time be necessary for the timely reply to the outstanding Office Action (or if such a petition has been made and an additional extension is necessary) petition is hereby made and the Commissioner is authorized to charge any fees (including additional claim fees) to Deposit Account No. 18-0988, Order No. BFGHP0265US.

Respectfully submitted,

RENNER, OTTO, BOISSELLE & SKLAR, P.L.L.

By _____
Cynthia S. Murphy
Reg. No. 33,430

1621 Euclid Avenue
Nineteenth Floor
Cleveland, Ohio 44115
(216) 621-1113

CERTIFICATE OF MAILING (37 CFR 1.8a)

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231.

Date: April 4, 2002 _____
Marian E. Vasquez

CLAIMS

1. An aircraft heated floor panel, comprising:

a plurality of layers cured together to form a lower support level and an upper heater level;

a metal face sheet for protecting the top of the panel from floor-traffic related damage; and

a pressure sensitive adhesive bonding the metal face sheet to the underlying support/heater layers.

2. An aircraft heated floor panel as set forth in claim 1, wherein the support layer includes a honeycomb layer sandwiched between fiber layers.

3. An aircraft heated floor panel as set forth in claim 1, wherein the heater level comprises a resistive element encapsulated in cured thermoset plastic plies.

4. An aircraft heated floor panel as set forth in claim 1, wherein the metal face sheet is made of a metal selected from aluminum, titanium, steel, or stainless steel.

5. An aircraft heated floor panel as set forth in claim 1, wherein the support layer includes a honeycomb layer sandwiched between fiber layers, the heater level comprises a resistive element encapsulated in cured thermoset plastic plies, and the metal face sheet is made of aluminum.

6. An aircraft heated floor panel as set forth in claim 1, wherein the underlying support/heater layers include a high temperature curing adhesive layer between the support level and the heater level.

7. An aircraft heated floor panel as set forth in claim 1, wherein the pressure sensitive adhesive is an acrylic pressure sensitive adhesive.

8. An aircraft heated floor panel as set forth in claim 1, wherein the pressure sensitive adhesive is a rubber pressure sensitive adhesive.

9. An aircraft heated floor panel as set forth in claim 1, further comprising a primer to enhance the bonding characteristics of the adhesive.

10. In combination, an aircraft and the aircraft heated floor panel of claim 1, wherein the perimeter of the lower support level is supported by a structure of the aircraft.

11. A method of making the aircraft heated floor panel of claim 1, said method comprising the steps of:

applying a layer of the pressure sensitive adhesive to the top of the heater level,

placing the metal face sheet on top of the adhesive layer,

curing the support/heater layers and the metal face sheet at an elevated curing temperature, and

cooling the cured layers and the metal face sheet to an ambient temperature;

wherein the pressure sensitive adhesive layer allows the metal face sheet to expand and contract at a different thermal expansion rate than the support/heater layers during the curing and cooling steps.

12. A method as forth in claim 11, wherein the curing temperature is at least about 250° F.

13. A method as set forth in claim 11, wherein the layer of the pressure sensitive adhesive is about 0.010 inch and wherein the curing temperature is about 280° F.

14. A method as set forth in claim 11, wherein the face sheet is cut to net shape prior to the curing step.

15. A method as set forth in claim 11, wherein a surface treatment is applied to the face sheet prior to the curing step.

19. An aircraft heated floor panel, comprising:

a plurality of layers cured together to form a lower support level and an upper heater level, these support/heater layers together having a certain rate of thermal expansion;

a face sheet for protecting the top of the panel from floor-traffic related damage, the face sheet having a different rate of thermal expansion than the underlying support/heater layers; and

an elastic adhesive bonding the face sheet to the underlying support/heater layers whereby the different rates of thermal expansion may be accommodated during curing procedures.

20. An aircraft heated floor panel as set forth in claim 19, wherein the face sheet has a higher rate of thermal expansion than the underlying support/heater layers.

21. An aircraft heated floor panel as set forth in claim 20, wherein the face sheet is made of metal.

22. An aircraft heated floor panel as set forth in claim 21, wherein the metal is selected from aluminum, titanium, steel, or stainless steel.

23. An aircraft heated floor panel as set forth in claim 21, wherein the elastic bonding adhesive is a pressure sensitive adhesive.

24. An aircraft heated floor panel as set forth in claim 23, wherein the pressure sensitive adhesive is an acrylic pressure sensitive adhesive.

25. An aircraft heated floor panel as set forth in claim 23, wherein the pressure sensitive adhesive is a rubber pressure sensitive adhesive.

26. A method of making the aircraft heated floor panel of claim 19, said method comprising the steps of:

applying a layer of the elastic bonding adhesive to the top of the heater level;

placing the face sheet on top of the adhesive layer;

curing the support/heater layers and the face sheet at an elevated curing temperature to form a composite structure; and

cooling the composite structure to an ambient temperature;

wherein the elastic bonding adhesive layer allows the face sheet to expand and contract at a different thermal expansion rate than the support/heater layers during the curing and cooling steps.

27. A method as set forth in claim 26, wherein the face sheet is cut to net shape prior to the curing step.

28. A method as set forth in claim 26, wherein a surface treatment is applied to the face sheet prior to the curing step.

* * *